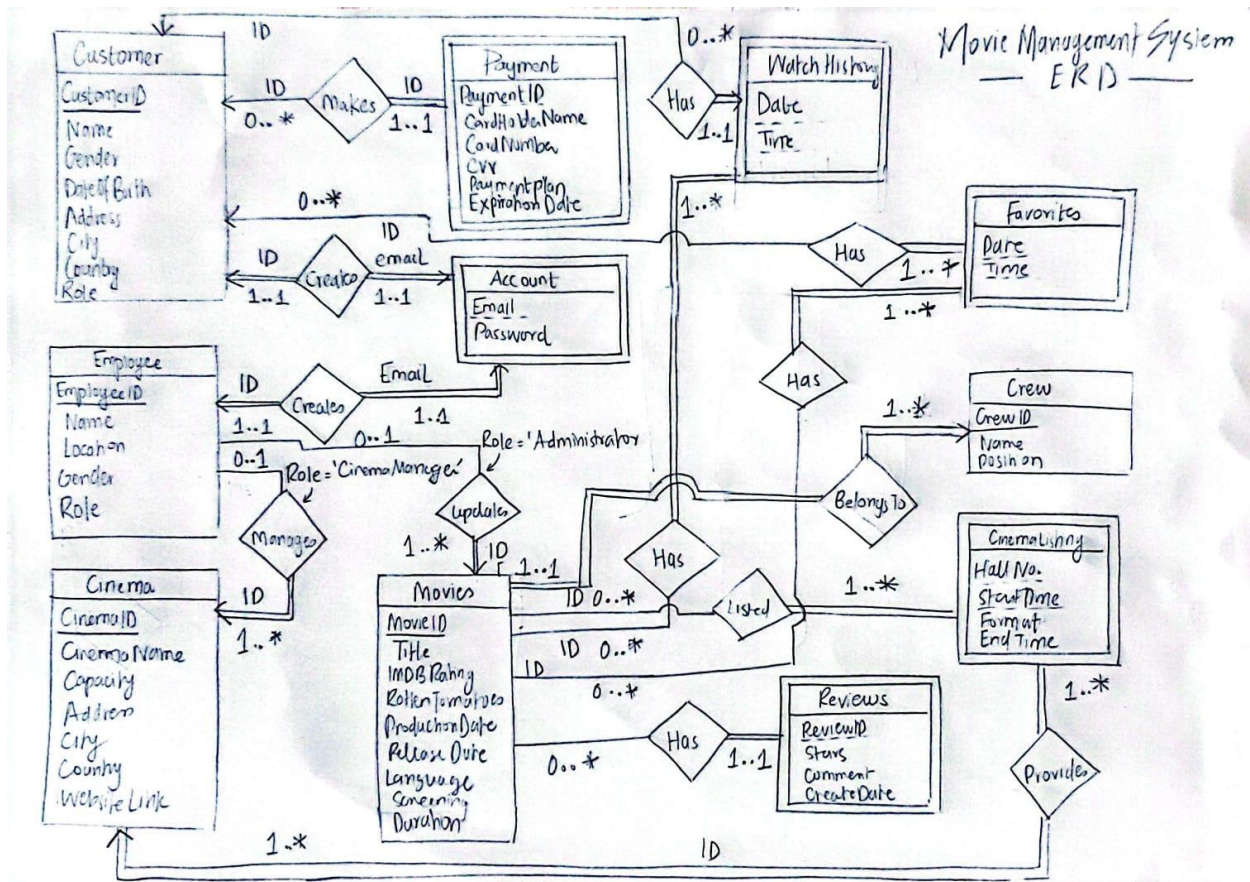Final Entity-Relationship Diagram:

The movie management system we have designed operates under the following assumptions:
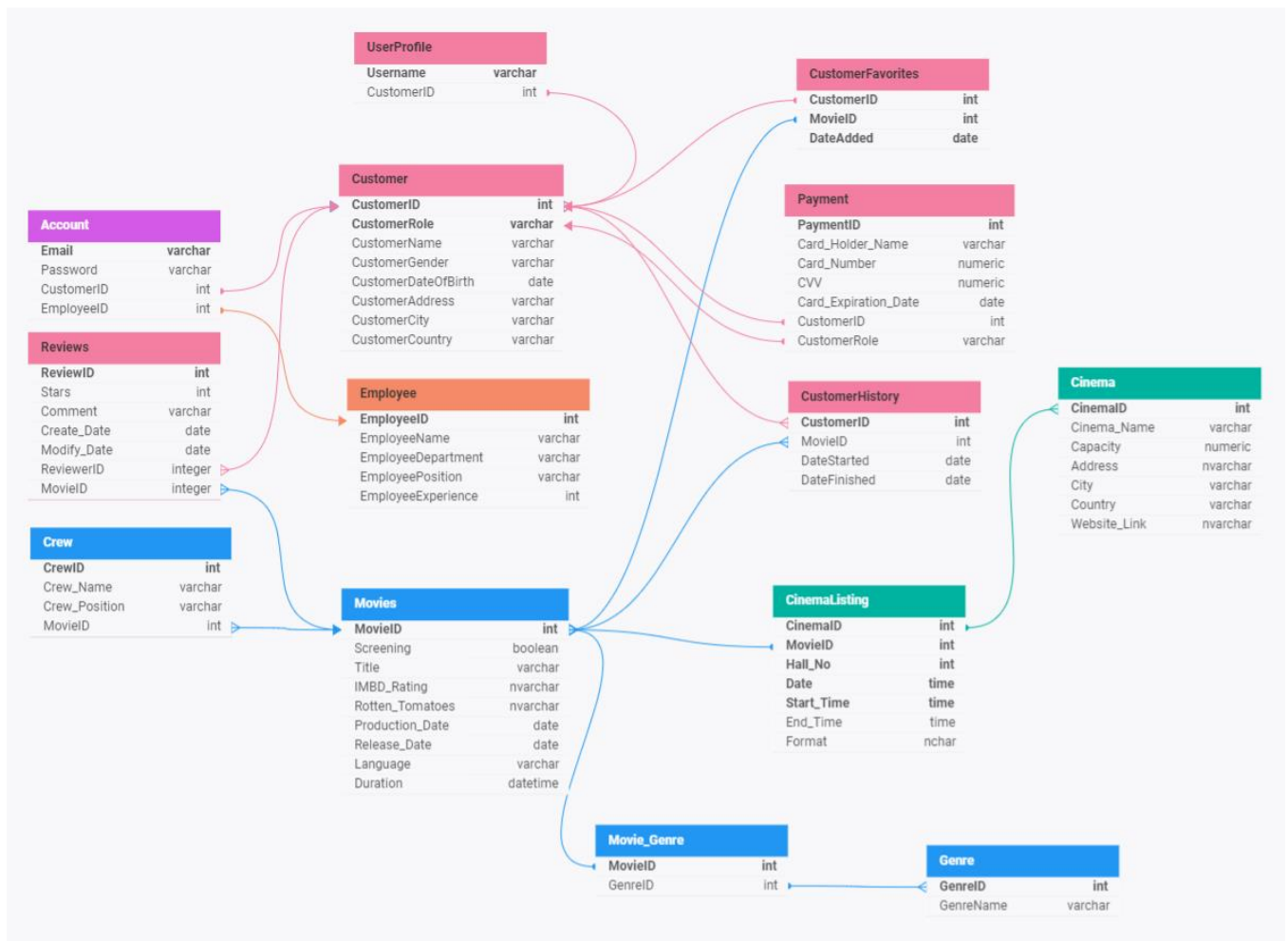
1. **Unique Customer Accounts**: Each account is assigned to a single customer only.
2. **Customer Roles**:
   a. Customers can have one of two roles: **regular** or **premium**.
   b. Premium customers must subscribe to a payment plan.
3. **Employee Roles**: Employees can have specific roles:
   a. **Cinema Manager**: Manages the cinema.
   b. **Administrator**: Updates the movie database.
4. **Account Creation**: Both customers and employees can create an account, and each will be guided to their respective interfaces.
5. **Customer Data**: Each customer has a watch history and a list of favorite movies.
6. **Movie Information**: Movies include reviews and crew information, and cinema listings can be created for movies.

7. **Customer Data**: Each customer has a watch history and a list of favorite movies.

Foreign Keys in ERD:

- **Payment**: Contains CustomerID and CustomerRole as a foreign key.
- **Account**: Includes CustomerID and EmployeeID as foreign keys.
- **Employee**: Has MovieID and CinemaID as foreign keys.
- **CinemaListing:** Has MovieID and CinemaID as foreign key
- **CustomerHistory:** Has CustomerID and MovieID as foreign keys
- **CustomerFavorites:** Has CustomerID and MovieID as foreign keys
- **UserProfile:** Has CustomerID as foreign key
- **Crew:** Has MovieID as foreign key
- **Reviews:** Has MovieID and CustomerID (as ReviewerID) as foreign keys

Final Relation Schema Diagram:

UserProfile

Username	varchar
CustomerID	int

CustomerFavorites

CustomerID	int
MovieID	int
DateAdded	date

Customer

CustomerID	int
CustomerRole	varchar
CustomerName	varchar
CustomerGender	varchar
CustomerDateOfBirth	date
CustomerAddress	varchar
CustomerCity	varchar
CustomerCountry	varchar

Account

Email	varchar
Password	varchar
CustomerID	int
EmployeeID	int

Payment

PaymentID	int
Card_Holder_Name	varchar
Card_Number	numeric
CVV	numeric
Card_Expiration_Date	date
CustomerID	int
CustomerRole	varchar

Reviews

ReviewID	int
Stars	int
Comment	varchar
Create_Date	date
Modify_Date	date
ReviewerID	integer
MovieID	integer

Employee

EmployeeID	int
EmployeeName	varchar
EmployeeDepartment	varchar
EmployeePosition	varchar
EmployeeExperience	int

CustomerHistory

CustomerID	int
MovieID	int
DateStarted	date
DateFinished	date

Cinema

CinemaID	int
Cinema_Name	varchar
Capacity	numeric
Address	nvarchar
City	varchar
Country	varchar
Website_Link	nvarchar

Crew

CrewID	int
Crew_Name	varchar
Crew_Position	varchar
MovieID	int

Movies

MovieID	int
Screening	boolean
Title	varchar
IMBD_Rating	nvarchar
Rotten_Tomatoes	nvarchar
Production_Date	date
Release_Date	date
Language	varchar
Duration	datetime

CinemaListing

CinemaID	int
MovieID	int
Hall_No	int
Date	time
Start_Time	time
End_Time	time
Format	nchar

Movie_Genre

MovieID	int
GenreID	int

Genre

GenreID	int
GenreName	varchar

Project Description

This project focuses on developing an all-encompassing movie management system designed to serve multiple user roles, including regular viewers, premium viewers, administrators, and cinema managers. Each user type is granted tailored access and permissions based on their role, ensuring a customized experience. The primary objective is to create a dynamic and user-friendly platform where movie enthusiasts can seamlessly explore, search, filter, and review movie content. At the same time, administrators and cinema managers are empowered with efficient tools to update, manage, and curate the movie database. By addressing both user engagement and database management, the system aims to enhance the overall movie-viewing experience and streamline administrative operations in the entertainment industry.

Functional Requirements

Module 1: Registrations

The system lets users register an account on the website as an administrator, manager and customer.

– Function 1a: Register as a Viewer: The register form prompts the user to enter their details i.e. Name, Email, Password. They will also be asked for location, which will be an optional field. The form is submitted and an unverified client account is created. The user receives a link on their email address which completes account verification.

– Function 1b: Register as a Premium Viewer: The register form prompts the user to enter their details i.e. Name, Email, Password. They will also be asked for location, which will be an optional field. The user is then redirected to another page on which they add their payment details. The form is submitted and an unverified client account is created. The user receives a link on their email address which completes account verification.

 – Function 1c: Register as an administrator: The register form prompts the user to enter their details i.e. Name, Email, Password, and other information. The form is submitted and an unverified customer account is created. The user receives a link on their email address which completes account verification.

– Function 1d: Register as a cinema manager: The register form prompts the user to enter their details i.e. Name, Email, Password, and other information. The form is submitted and an unverified customer account is created. The user receives a link on their email address which completes account verification.

Module 2: Login

Users would login as either viewers, administrator or cinema managers. Depending on the role, they would interact with varying interface; viewers would be able to search/view movies, filter movies according to their choice and leave a review. Administrators can add/delete movies, reviews/ratings and edit descriptions. Cinema managers can add/delete/edit movies streaming in the cinema. Both administrators and cinema managers can view and search movies.

- Function 1a: Viewers – Login form would ask for user ID and password (it would accordingly detect whether it belongs to a viewer and hence show the required interface). For security purposes, a confirmation link would be sent to the associated email ID.

- Function 1b: Administrator - Login form would ask for user ID and password (it would accordingly detect whether it belongs to an admin and hence show the required interface). For security purposes, a confirmation link would be sent to the associated email ID.

- Function 1c: Cinema managers - Login form would ask for user ID and password (it would

accordingly detect whether it belongs to a manager and hence show the required interface). For security purposes, a confirmation link would be sent to the associated email ID

- Function 2: ALL – There will be a forgot password link which would send an email to

the associated email ID to start a resetting process

Module 3: Search/Add/Delete

- Function 1: All Viewers – They can input a movie title into the search bar to find specific films.

- Function 2: All Viewers – They can click on a movie title displays its details, including title, producer, ratings, IMDB rating, duration, and genre. A link to the movie's reviews is also provided.

-Function 3: All Viewers – They can add movies to their Wishlist for future reference or potential viewing.

-Function 4: Premium Viewers – Premium users have the privilege of downloading movies for offline viewing.

-Function 5: Administrator – They can add new movies to the database, including all relevant details. They can also add initial reviews to the database.

-Function 6: Administrators – They have access to modify movie details and user reviews as needed. This includes updating information and correcting errors.

-Function 7: Administrators - They can also adjust user subscription statuses, switching between premium and regular levels as requested by the users.

- Function 8: Administrator – They can delete a movie from the movie database with all its details.

-Function 9: Cinema managers - They can add movies to their cinema's schedule, specifying details such as showtimes, pricing, and any special screenings.

-Function 10: Cinema managers – They can remove movies from their cinema's schedule, typically when the movie's run has ended or due to other reasons.

-Function 11: Administrator – If a movie is playing in a cinema located in the viewer's city, the administrator will update the movie database by marking the "Being Screened" column as "Yes." Otherwise, it will be marked "No".

Module 4: Filter

This advanced feature allows users to refine their movie search using various criteria, including genre, production country, duration, ratings, release year, director, and whether the movie is currently showing in a nearby cinema. Users can apply one or more filters to narrow down their results. The system will then display a list of movies that match the specified criteria. If the user searches for a movie that's playing in a cinema, the system will also provide information about the nearby theaters where it's showing.

Module 5: Review and Feedback

- Function 1: Viewers – for movies they have watched, viewers would be able to rate the movies. This rating would be on a scale of 1-10 with 1 being worst and 10 being best.

-Function 2: Administrator – admin would be able to view the reviews and can choose to delete a movie constantly getting bad reviews.

-Function 3: Viewers – If they like a movie, they can mark it as a favorite so their movie suggestions will show similar movies.

Screens
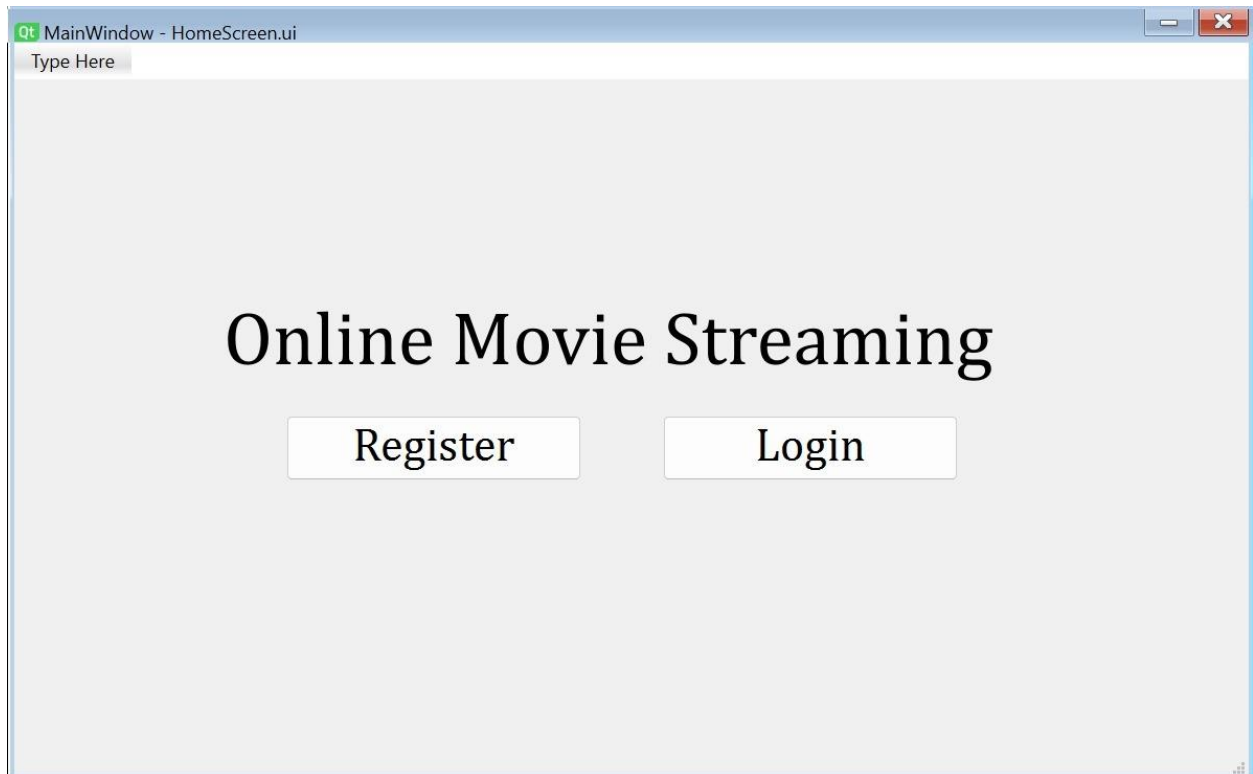
HomeScreen that the user interacts with for the first time. The user can either register their account or Login (if they already have an account made)

MainWindow - Register Options.ui

Type Here

Register Your Account

Select Your Role

Viewer

Premium Viewer

Administrator

Cinema Manager

Already have an account?

If the user clicks on Register, they get to select their role

MainWindow - RegisterAsViewer.ui

Type Here

Name: *

Email: *

Password: *

Location:

Register

If the user selects the role of a viewer, they get directed to this window and enter information to register

If the user selects the role of a premium viewer, they must fill in the details and press next

After clicking next, they get directed to the window for payment details

Qt MainWindow - RegisterAsAdministrator.ui

Type Here

Name: *

Email: *

Password: *

Job Title:*

Department:*

Office Location:*

Experience Level:*   Beginner   ⌄   Register

If the user selects the role of an Administrator, they get directed to this window and enter information to register

Qt MainWindow - RegisterAsCinemaManager.ui

Type Here

User Information

Name: *

Email: *

Password: *

Phone Number:*

Experience:*

Cinema Information

Cinema Name: *   Capacity: *

Location:*   Register

If the user selects the role of an Cinema Manager, they get directed to this window and enter information to register
If the users have already registered, they can login after entering the username and password (the roles will be automatically identified)
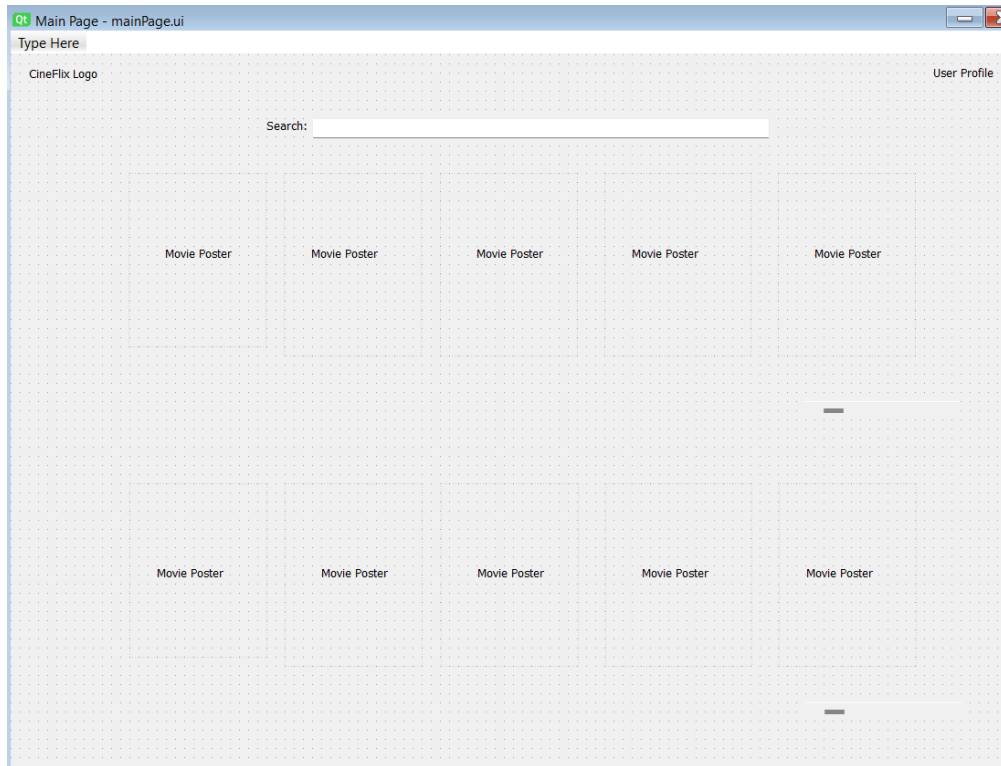
Main Screen after Login
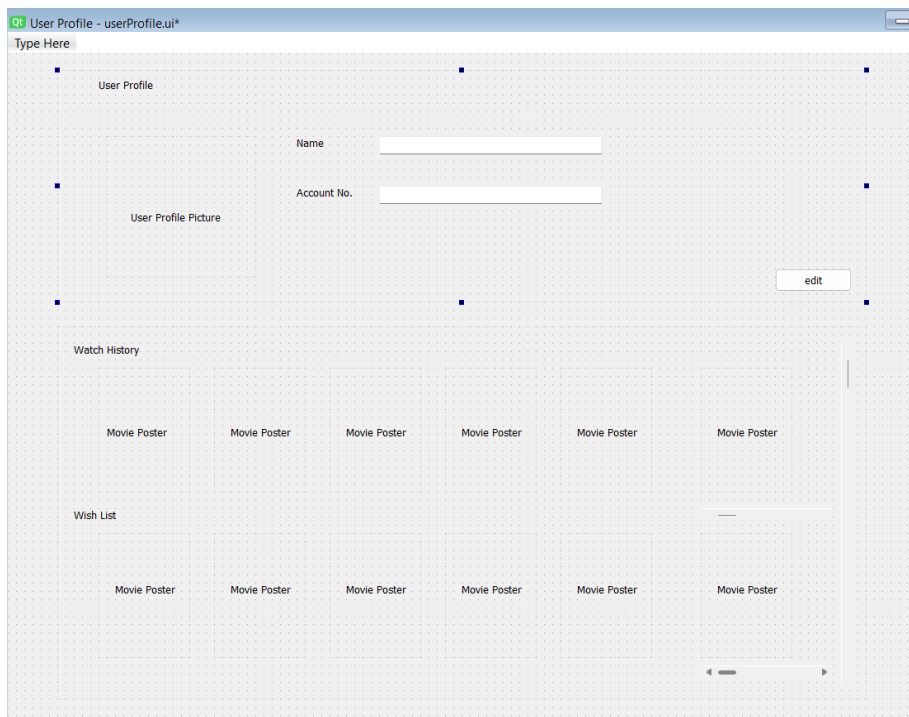
User Profile Page

Admin Profile Page

Cinema Manager Profile Page